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A study on the effect of needling baihui acupoint on heart rate variability in patients with depression

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Abstracts: Objective: To observe the change in heart rate variability (HRV) at different time intervals during the needling of Bai Hui acupoint.The effect of acupuncture on the sympathetic nerve and vagus nerve is also studied, thereby providing theorical evidence for the treatment of depression. **Methods:** The Hamilton Depression Rating Scale (HAMD) was used to select 33 patients (6 men, 27 women, ages 22-72).Bai Hui acupoint was needled and an AR12 HRV device was used to measure the HRV total power (TP), high frequency (HF) power, low frequency (LF) power, LF/HF, and mean heart rate (HRmean) values at 10 minutes before needle insertion, 10 minutes after needle insertion, 10 minutes after needle manipulation, and 10 minutes after needle removal.The data was then exported from the device, and using short term recording method, the parameter changes were analyzed every 5 minutes.SPSS 18.0 was used to perform statistical analysis, with $P<0.05$ having statistical significance.**Conclusion:**(1)Acupuncture on Bai Hui acupoint can increase HRV in patients with depression, and its lasting effects are evident. (2) Acupuncture on Bai Hui acupoint can increase vagus nerve excitability in patients with depression. (3) The treatment effect of acupuncture on Bai Hui acupoint works mostly by influencing the vagus nerve in patients with depression.

Keywords: Needling; Bai Hui; Depression; Heart rate variability

Depression is a type of low mood-based mental illness. WHO reports that as of 2012, a total of 350 million people worldwide will suffer from depression. It is expected that by 2020, depression will be second only to heart disease in disease prevalence.

Most Western Medicine treatments are drug-based, but its therapeutic targets are singular, it has many side effects, and a poor compliance rate. Traditional Chinese Medicine (TCM), especiallyacupuncture treatment, through regulating yin, yang, qi, and blood, has achieved satisfactory clinical results, has few side effects, and is readily acceptable to patients. Heart Rate Variability (HRV) has been a hot research topic in recent years, especially in the analysis of the relationship of sympathetic and parasympathetic nerve activity. It can analyze the effect of changes in the autonomic nervous system on depression generation, development, prognosis and rehabilitation. Combining acupuncture and HRV analysis of acupuncture on the autonomic nervous system function, we can infer its effectiveness in patients with depression, which is the innovative design of this experimental study.

1 Materials and methods

1.1 **The Source of cases**: Neurology Dep. in the First Affiliated Hospital ofHeilongjiang University of Chinese Medicine (2010.9-2011.3), the number of random men and women, irrespective of age. Total 33 patients(27 females, 6 males; mean age ± SD: 49.5 ± 13.1 years; age range of 22-72 years old).

1.2 **Diagnostic criteria**

Diagnostic criteria of TCM:According to *"TCM Syndrome Diagnostic efficacy of the standard*"2012 Edition[01] which is released by the State Administration of TCM of China.

Diagnostic criteria of Western medicine: According to*"Chinese classification and diagnostic criteria for mental disorder-3Edition"* (CCMD-3)[02] and *"International disease classification and diagnostic criteria-10Edition"*(ICD-10)[03].

1.3 **Inclusion criteria**

⑴Accord with the diagnostic criteria in Depression of traditional Chinese medicine ;

⑵Accord with the diagnostic criteria in Depression of western medicine ;

⑶without taking antidepressant medication in 2 weeks ;

⑷Hamilton Depression Scale17 evaluation,total score greater than 14 and less than 24 ;

⑸Voluntary, and agreement will be signed.

1.4 **Research methods**

1.4.1**The main instrument**

A Medilog AR12 HRV recorder (Huntleigh Healthcare, Cardiff, UK)

1.4.2**The main appliance**

HuaTuo brand acupunctureneedle (1.5cun)（Φ0.35×40mm）

1.4.3 **Acupoint location**

The acupoint was located on each patient according to the People's Republic of China Standards Manual "*Acupoint Naming and Location*" (GB/T 12346-2006)[04]. The acupoint Bai Hui (DU20) is located "7 cun directly above the midline of the posterior hairline, or at the intersection of the midline of the head and the line connecting the apex of both ears".

1.4.4**Needling Method**

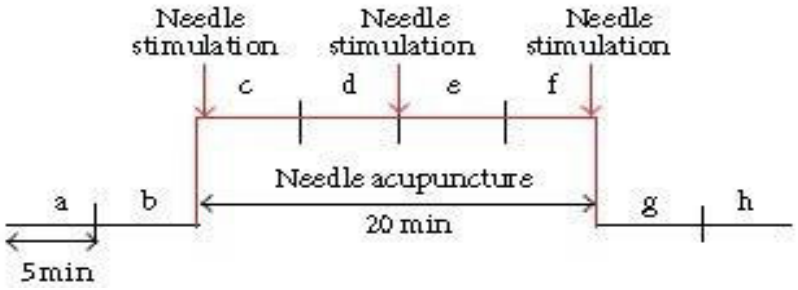
The same acupuncture practitioner performed the needling throughout the experiment to avoid differences in needling technique. Before needling, the skin at the acupoint location was disinfected with ethanol using standard disinfection procedures. Hua Tuo brand disposable stainless steel acupuncture needles were used, with a subcutaneous needling angle. The needle was inserted to a depth of 0.5-0.8 cun (16.5-26.4mm). When inserting the needle, after the practitioner feels the arrival of qi, an even reducing and tonifying twirling needle manipulation method was used for 20 seconds, with 6 spins every second for a total of 120 spins. The needle was retained for 10 minutes, and the manipulation procedure was performed once again. The needles were retained for 10 more minutes after which the manipulation procedure was performed one last time and the needle was removed. After removing the needle, the patient remained at rest in a supine position for 10 minutes.

1.4.5**Detection Method**

At the beginning of the experiment, after the patient rests for 10 minutes, the patient is fitted with a Medilog AR12 heart rate variability recording device. The device is then turned on the applicable values are recorded.

1.4.6 **Observed values and recording method**

The observed values were selected according to recommendations by the European Society of Cardiology. Frequency domain analysis was used to analyze the short term electrical signals (5min). Total power (TP), high frequency power (HF), low frequency power (LF), LF/HF, and mean heart rate (HRmean) values were observed. The entire experiment lasted 40 minutes and was divided into 8 five minute time intervals (a-h). The frequency domain analysis values were recorded for each time interval.(figure 1)



	a	b	c	d	e	f	g	h
TP	1.25±0.97	1.12±1.14	1.56±1.35	1.16±0.93	1.46±1.36	1.39±1.40	2.05±1.43	1.59±1.19
LF	2.61±1.82	2.25±1.48	2.83±2.24	2.66±1.98	2.65±1.92	2.95±2.84	3.21±2.62	3.34±2.64
LF	1.37±1.16	1.37±1.16	1.79±2.34	1.54±1.24	1.76±1.68	1.92±2.41	2.05±2.09	1.78±1.85
LF/HF	2.59±2.00	2.21±1.76	2.69±2.26	2.83±3.81	2.79±3.29	2.88±3.76	2.51±2.25	2.61±2.49
HR mean	72.7±9.33	72.3±9.38	71.6±9.69	71.6±9.98	70.8±10.1	69.9±10.7	69.9±10.3	70.4±10.4

1.4.7**StatisticalMethod**

All information will be entered SPSS18.0 software to build a database, measurement data with the mean ± standard deviation expressed. Application Repeated measures ANOVA and Tukey Test methods for statistical analysis, $P < 0.05$ prove a statistically significant difference.

2 Results and discussion

2.1 **Results:** The effect of acupuncture on Bai Hui at different time intervals on HRV values and mean heart rate (HRmean):(chart 1)

⑴Five minutes after the removal of the needle from Bai Hui acupoint (g), the TP value was significantly increased compared to 10min before acupuncture (a, b), 5-10min after the arrival of qi sensation (d), and 10min after needle manipulation (e, f) ($P<0.05$). The TP value at 5-10min after needle removal (h) was significantly increased compared with 5min before needle insertion (b) ($P<0.05$).

⑵The HF value 5min after needle removal (g) was significantly increased compared to 10min before needle insertion (a, b) ($P<0.05$).

⑶There was no significant differences in LF values and LF/HF values between time intervals (P>0.05).

⑷HRmean values at 10min after needle manipulation (e, f) and 10min after needle removal (g, h) were significantly decreased compared to 10min before needle insertion (P<0.05). There was a significant decrease in HRmean values at 5min after needle removal (g) when compared to 5-10min after needle insertion (P<0.05).

2.2 **Discussion:** Numerous studies show that patients with depression also have varying degrees of autonomic nervous system dysfunction, and these dysfunctions will increase the patient's depressive state. The balance between the sympathetic and vagal systems is the basic premise of proper autonomic function. Therefore, if acupuncture on Bai Hui acupoint can have a positive adjustment effect on the sympathetic or vagus nerves, it can produce a therapeutic effect in depression. According to the research results, acupuncture on Bai Hui acupoint produced a significant change in patients' heart rate variability. The TP value is an indicator of the overall HRV condition, and was significantly greater after needle removal than at the time intervals before needle insertion, after needle insertion, and after needle manipulation (P <0.05). This suggests that acupuncturing Bai Hui acupoint can affect the overall HRV, increasing HRV and improving heart rate variability in patients with depression. The HRV values 5-10min after needle removal compared with 5min before acupuncture were still elevated, suggesting an obvious aftereffect was present.Numerous studies [05,06,07] have pointed out that patients with depression have TP values and heart rate variability values that are significantly lower than that of normal people. This research suggests that an increased TP value can significantly improve the HRV function in patients with depression, thereby regulating the comprehensive changes in the sympathetic and vagal systems. Although LF and LF/HF values at each time interval were not statistically significant, in Figure 3 it can be seen that the LF values at the c, e, and g time intervals showed an increasing trend. This shows that increasing the amount of acupuncture stimulation can lead to an increase in regulation, which is mainly effected by the sympathetic system. The same phenomenon also appears in Figure 4. The HF values also showed an increasing trend as the amount of stimulation increased, and there was a significant increase after needle removal when compared with before needle insertion (P <0.05), prompted by an increase in regulation by the vagus nerve.Some studies [08] have shown that patients with depression have decreased sympathetic and vagus nerve excitability. However, this decrease has not been explicitly quantified. Most people believe that in depression patients with mood symptoms as their primary symptom, vagus nerve excitability is decreased significantly. Zhang Qian et al. [09] found through their experiments that there was autonomic nerve function damage in patients with depression when compared with normal subjects, with damage mainly to the vagus nerve. This research suggests that acupuncture can simultaneously regulate both the sympathetic and vagus nerves. HRmean values after needle manipulation and after needle removal slowed significantly (P<0.05) compared to 10min before needle insertion, but the changes were within normal ranges. A decrease in heart rate indicates dominant vagal activity, suggesting that the autonomic nervous system regulating effect of needling Bai Hui acupoint in patients with depression may be primarily vagus nerve based. In summary, acupuncturing Bai Hui acupoint can increase HRV function in patients with depression, and regulate sympathetic and vagus nerve balance.

2.3**Conclusion:**(1)Acupuncture on Bai Hui acupoint can increase HRV in patients with depression, and its lasting effects are evident. (2) Acupuncture on Bai Hui acupoint can increase vagus nerve excitability in patients with depression. (3) The treatment effect of acupuncture on Bai Hui acupoint works mostly by influencing the vagus nerve in patients with depression.

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BI-Ning capsule on experimental study on HPRT gene in patients with gouty arthritis

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Abstracts:Objective: This researchobserve the effect on patients of HPRT (hypoxanthine-guanine phosphoribosyltransferase) gene with 78 cases of acute goutyarthritis by bi-Ning capsule.**Methods**: 78 cases of acute gouty arthritis by random principles are divided into bi-Ning capsule group and the control group, observation of serum HPRTmRNA levels in both groups before and after treatment. Results: serum HPRTmRNA-expression is better than a control group of the pilot group. **Conclusion**: BI-Ning capsule is superior to the western medicine in the therapeutic effect on acute gouty arthritis, and it improves the expressing levels of HPRTmRNA in patients with acute gouty arthritis.

Key words: acute gouty arthritis; bi-Ning capsule; HPRTmRNA.

Gout and hyperuricemia is the disease of multifactorial inheritance.The serum uric acid rise is the important biochemical basisof gout.The exoterica of the scanty key enzyme inpurine metabolism process is main causes of hyperuricemia ,which through our topics group research further confirmed.HPRT gene is purine metabolism remedy synthesis way of key enzyme, HPRT gene defects can led to its activity reduced and can make bird purine nucleotide and times yellow purine nucleotide reduced, that eventually led to its end late product uric acid increased. The report is as follows:

1. Clinical data

1.1 Source of case

In this research 78 gouty arthritis patients hail from the first affiliated hospital of Heilongjiang University of traditional Chinese medicine Rheumatology from 2007 to 2011,which male in 71 cases, women's 7. Normal human peripheral blood samples, taken from our 5 healthy volunteers.